

# Proposed Means for the Trump Administration to Further Fusion Energy Development in the Private Sector

We propose that the United States Government embark on a new program to incentivize the private sector to support and engage in fusion energy science, research and development leading to the successful demonstration of a controlled, sustained, net energy producing fusion reaction within ten years.

Whereas the US scientific community has actively studied and experimented with atomic fusion for energy production since the early 1950s, virtually all the US government work conducted in US national laboratories has been centered on two scientific fusion “confinement” approaches:

1. Magnetic Confinement Fusion ([MCF](#)) principally conducted using tokamaks, spheromaks, and stellarators.
2. Inertial Confinement Fusion ([ICF](#)) using laser driven techniques.

Furthermore, the enormous worldwide lead America had in the basic understanding of the science governing fusion energy was dissipated in 1985 when our government capitulated to the suggestions of the Soviet Union. This led the US to virtually [abandon its national fusion programs](#) in favor of what would become [ITER](#) twenty years later. ITER is an international science based program to continue the experimental research the U.S. started.

The history of America’s ill-fated fusion energy development activities is described in our article, [“Who Killed Fusion.”](#)

Over the last 60 years, the scientific community has discovered and compiled an enormous amount of scientific and mathematical knowledge concerning fusion. However the US has been stuck in a scientific quagmire of only pursuing fusion approaches involving [MCF](#) and, to a lesser extent, [ICF](#). These approaches, by their very nature, require enormous facilities and experimental scientific equipment costing hundreds of millions and even billions of dollars.

Recognizing that the facility cost is the largest component of fusion science, research and development costs, which is the principal impediment to fusion progress, Drs. Irvin Lindemuth, Richard Siemon, and Kurt Schoenberg of Los Alamos National Laboratory began the examination of fusion development costs in a fundamental way.

The results of the Lindemuth, et al, analysis were presented in numerous scientific workshops and published in [“Why Magnetized Target Fusion Offers A Low-Cost Development Path for Fusion Energy.”](#) Simply put, a new set of preferred fusion parameters are set forth leading to more easily achievable [triple product Lawson criterion](#) in terms of temperature, confinement time, and density.

A Tutorial on the Parameter Space of Magnetized Target Fusion (MTF) by Irvin Lindemuth, Ph.D., presented at annual meeting of American Physical Society Division of Plasma Physics, Nov 2016, describes the physics and mathematics of MTF.

**Therefore we propose** that the Trump Administration pursue a fundamentally new way forward to allow America to regain the lead in fusion energy science and after research, development leading to the ultimate commercialization of fusion power systems before the world depletes fossil fuels beyond their point of economic viability.

**To wit:**

- The President of the United States will Issue a [presidential proclamation challenging the American people](#) and the private sector to demonstrate a controlled sustained net energy producing fusion energy reaction by 2030.
- The American Congress shall enact a private sector fusion energy bill by Q3 2017 that shall:
- Establish the national Private Enterprise Fusion Energy Program (**PEFEP**) to conduct science, research and development of fusion energy as a matter of the national security of the U.S.
- The **PEFEP** legislation shall include program goals and definitions of key concepts, identifiers, and metrics; the principle objective of which is the demonstration of a proof of concept fusion reactor with a Deuterium-Tritium “controlled plasma burn” within 10 years, followed by additional demonstrations of plasma burns using so called “aneutronic fuel cycles;” the direct conversion of fusion produced energy to electricity without the need for a thermally coupled electromagnetic generator; and a series of practical designs capable of being produced, licensed by the NRC and purchased by the energy producing industry having acceptable utility generation capacity life cycles to produce electricity and synthetic liquid fuels at a cost competitive with base line energy costs.
- The **PEFEP** shall authorize funding through government loans for the acquisition of facilities location site property in government controlled areas such as the nuclear proving sites in Nevada thus enabling private fusion companies to conduct early experiments using tritium, a mildly radioactive isotope of hydrogen and further funds to enable the expeditious relocation of companies who may have significant facilities located in areas unable to receive needed NRC licensing for the use of tritium. Additional funds or near zero interest loans will be provided to such companies to build facilities, roadways, and utility access on such property.
- The **PEFEP** shall be authorized to award participating private companies significant milestone payments upon a company’s achievement of an approved milestone event; such milestone events shall include the first controlled sustained net energy DT reaction; the first controlled sustained net energy aneutronic fuel cycle reaction and various other milestone events which shall be identified and codified in the **PEFEP**.
- The **PEFEP** shall encourage chartered companies to pursue [MTF](#) approaches in accord with the teachings of Lindemuth, et al, however not at the exclusion of other proposed approaches reviewed by an outside evaluation authority.
- The **PEFEP** shall authorize the formation of an approved private fusion energy consortium who shall be chartered to raise funds through a variety of means described and approved in the enabling legislation to be distributed to private companies engaged in fusion science, research and development on a grant and milestone award basis; such funds shall not be taxed as income pursuant to changes in the proposed tax code herein provided.
- The approved private fusion energy consortium shall include a scientific executive review board consisting of highly qualified and credentialed fusion and plasma physicists who shall review private enterprise fusion energy companies as part of the chartered qualification process and shall evaluate the progress of each such company against published criteria

germane to each specific company and issue recommendations for milestone performance awards.

- The **PEFEP** shall direct the U.S. Department of Treasury, IRS to incorporate the following changes and additions in any new Trump administration revised tax code:
  - Any qualified private enterprise company engaged in fusion science, research and development chartered by the **PEFEP** shall be qualified to receive 501c3 exempt charitable funds as part of such a firm's capitalization in accordance with accounting rules set forth by the IRS contemporaneously with such provision.
  - Any qualified private enterprise company engaged in fusion science, research and development chartered by the **PEFEP** that receives either 501c3 funds or funds from an approved fusion energy consortium shall pay no federal income tax on such grants or awards.
  - Any qualified private enterprise company engaged in fusion science, research and development chartered by the **PEFEP** that receives milestone achievement award funds from the federal government or authorized fusion energy consortium pursuant to the **PEFEP** shall pay no income tax on such funds.
  - Any qualified private enterprise company engaged in fusion science, research and development chartered by the **PEFEP** shall be qualified to deduct all expenses associated with the firm's business as part of its science, research and development activities at a rate of 2:1 against future earnings; such tax credit loss carry forward shall have no expiration assuming the firm continues its business, regardless if a successful future revenue stream is created from fusion related products and services; said loss carry forwards can be transferred to any investor in such a company pursuant to the rules and regulations of the tax code governing same.
  - Any qualified private enterprise company engaged in fusion science, research and development chartered by the **PEFEP** shall be qualified to capitalize all expenses related to the preparation and prosecution of patents based on the work of the company and its employees as assigned to the company.
  - In the event that a qualified private enterprise company engaged in fusion science, research and development chartered by the **PEFEP** is unable to obtain profitability based on the capitalized fusion related expenses it may treat all such capitalized expenses as a loss carry forward based on 2 times the actual accrued losses.
  - Such other desirable tax benefits as may be defined as part of the process leading to the preparation and enactment of the **PEFEP**.